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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/986,588	11/09/2001	Chi-Meng Liao	DED/3073/56	5811

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EXAMINER	
BURCH, MELODY M	
ART UNIT	PAPER NUMBER
3683	

DATE MAILED: 02/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/986,588	LIAO, CHI-MENG	
	Examin r	Art Unit	
	Melody M. Burch	3683	

-- The MAILING DATE of this communication appears on the cover sheet with the correspond nc address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 November 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☒ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 November 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the limitation of the enlarged portion being formed by paring a part of the screw nut into a curved surface as claimed in claim 6 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

2. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

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Specification

3. The abstract of the disclosure is objected to because the phrase "(Fig. 2)" at the bottom of the abstract should be deleted. Correction is required. See MPEP § 608.01(b).

4. The disclosure is objected to because of the following informalities:

- On pg. 2 line 8 "blot" should be changed to –bolt--;
- On pg. 4 line 11 "crew" should be changed to –screw--;

- On pg. 5 line 20 "a" should be deleted.

Appropriate correction is required.

Claim Objections

5. Claims 1-9 are objected to because of the following informalities:

- In line 6 of claim 1"thereof" should be changed to the component that the term "thereof" intends to refer to;
- In line 8 of claim 1 the phrase "grooves that causing said screw bolt and said screw nut able to" should be reworded for grammatical purposes.

Claims 2-9 are objected to due to their dependency from claim 1.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re: claim 1. Claim 1 recites the limitation "said former groove" in lines 5-6 and "said two grooves" in lines 7-8. There is insufficient antecedent basis for this limitation in the claim. Examiner recommends using terms such as --a first groove-- and --a second groove--.

Re: claim 3. Claim 3 recites the limitation "said leak proof element" in line 1. There is insufficient antecedent basis for this limitation in the claim. Claim 2 recites "several leak proof elements".

Claims 2 and 4-9 are indefinite due to their dependency from claim 1.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by US Patent 5704250 to Black.

Re: claim 1. Black shows in figure 3 the use of a ballscrew with cooling means comprising: a screw bolt 16 having a spirally threaded groove formed around the outer surface thereof, a hollow screw nut 54 to be sleeved over the screw bolt also having another spirally threaded groove corresponding to the former groove being formed around the inner surface thereof, a plurality of rolling balls 62,64 interposed between the two grooved that cause the screw bolt and the screw nut to be able to rotate with each other, and an outer cover 30 cover the screw nut such that a cavity 86 being formed therebtween for a cooling agent to flow through thereby reducing the temperature of the screw nut by way of its connection to the reduced temperature of the motor 50.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 1-3 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 4741221 to Hudimac, Jr. in view of US Patent 5344230 to Kowalczyk et al.

Re: claim 1. Hudimac, Jr. shows in figure 2 the use of a ballscrew with cooling means comprising: a screw bolt 5 having a spirally threaded groove formed around the outer surface thereof, a hollow screw nut 22 to be sleeved over the screw bolt also having another spirally threaded groove corresponding to the former groove being formed around the inner surface thereof, a plurality of rolling balls 43 interposed between the two grooved that cause the screw bolt and the screw nut to be able to rotate with each other, and an outer cover 20 cover the screw nut such that a cavity 31 being formed therebtween for an agent to flow through. Kowalczk et al. teach in col. 3 lines 7-9 the use of a nut member 14 being surrounded by an outer casing 15 to form a cavity 16 therebetween for introducing a fluid used specifically for cooling. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the agent in the cavity of Hudimac, Jr. to have included a cooling agent, as taught by Kowalczk et al., in order to provide a means of preventing

overheating of the ball screw components and consequently preventing interference between the screw bolt and the nut due to thermal expansion.

Re: claims 2 and 3. Hudimac, Jr., as modified, teaches in figure 2 of Hudimac, Jr., several leak proof elements 32 (left and right) provided between the screw nut and the outer cover for preventing leakage of the cooling agent.

Re: claim 7. Hudimac, Jr., as modified, teaches in figure 2 of Hudimac, a guiding tube 33 for guiding flow of the cooling agent being installed (established in an indicated place) in the cavity.

12. Claims 1, 4, 6, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 3029792 to Rasmussen in view of US Patent 5344230 to Kowalczyk et al.

Re: claim 1. Rasmussen shows in figure 2 the use of a ballscrew with cooling means comprising: a screw bolt 40 having a spirally threaded groove formed around the outer surface thereof, a hollow screw nut 30 to be sleeved over the screw bolt also having another spirally threaded groove corresponding to the former groove being formed around the inner surface thereof, a plurality of rolling balls 23,25 interposed between the two grooved that cause the screw bolt and the screw nut to be able to rotate with each other, and an outer cover 10 cover the screw nut such that a cavity 13 being formed therebtween for an agent to flow through. Kowalczk et al. teach in col. 3 lines 7-9 the use of a nut member 14 being surrounded by an outer casing 15 to form a cavity 16 therebetween for introducing a fluid used specifically for cooling. It would have been obvious to one of ordinary skill in the art at the time the invention was made

to have modified the agent in the cavity of Rasmussen to have included a cooling agent, as taught by Kowalczk et al., in order to provide a means of preventing overheating of the ball screw components and consequently preventing interference between the screw bolt and the nut due to thermal expansion.

Re: claims 4 and 6. Rasmussen show in figure 1 the limitation wherein an enlarged portion of the cavity shown between element numbers 11 and 13 is made between the screw nut and the outer cover.

Re: claim 7. Rasmussen, as modified, teaches in figure 2 of Rasmussen a guiding tube 22 for guiding flow of the cooling agent being installed (established in an indicated place) in the cavity.

13. Claims 1 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 5809838 to Miyaguchi et al. in view of US Patent 5344230 to Kowalczyk et al.

Re: claim 1. Miyaguchi et al. show in figure 12 the use of a ballscrew with cooling means comprising: a screw bolt 1 having a spirally threaded groove formed around the outer surface thereof, a hollow screw nut 2 to be sleeved over the screw bolt also having another spirally threaded groove corresponding to the former groove being formed around the inner surface thereof, a plurality of rolling balls 3 interposed between the two grooved that cause the screw bolt and the screw nut to be able to rotate with each other, and an outer cover 18a cover the screw nut such that a cavity SS being formed therebtween for an agent to flow through. Kowalczk et al. teach in col. 3 lines 7-9 the use of a nut member 14 being surrounded by an outer casing 15 to form a cavity

16 therebetween for introducing a fluid used specifically for cooling. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the agent in the cavity of Miyaguchi et al. to have included a cooling agent, as taught by Kowalczk et al., in order to provide a means of preventing overheating of the ball screw components and consequently preventing interference between the screw bolt and the nut due to thermal expansion.

Re: claim 9. Miyaguchi et al. show in figure 12 an entrance pipe 43 with an opening 42 and an exit pipe with an opening shown immediately opposite element 43 formed in the screw nut for circulation of the agent.

14. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 3029792 to Rasmussen in view of US Patent 5344230 to Kowalczyk et al. as applied to claim 4 above, and further in view of US Patent 3169407 to Newell. Newell teaches in figure 2 the use of a screw nut 2 formed by paring a part of the screw nut into a planar shape. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the enlarged cavity portion of the screw nut of Rasmussen, as modified, to have included a part formed into a planar shape, as taught by Newell, as an obvious matter of design choice. Applicant has not disclosed that having the enlarged cavity portion being formed from a planar shape solves any stated problem or is for any particular purpose and it appears that the enlarged cavity portion would perform equally well with any shape that would result in the cavity being enlarged.

Allowable Subject Matter

15. Claim 8 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

16. In order to complete the record, it should be noted that no conflict appears to presently exist between the subject matter defined by the instant claims and the subject matter of the claims of applicant's and/or assignee's copending application no. 09/839364 has been made of record. Accordingly, no double patenting rejection is entered into the instant application. See MPEP 804+ concerning double patenting type of rejections, if necessary. Applicant and/or assignee should maintain this clear line of patentable distinction between the instant claims and the claims of the indicated patent application.

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patents: 4809824 to Fargier et al., 6247556 to Chen, 4074587 to Brusasco, and 5168767 to Morita teach the use of ball screws having a screw bolt, a screw nut, balls, and a cavity formed on the outside of at least a portion of the screw nut, 5016335 to Becker et al. and 5291969 to Diederich, Jr. teach the use of a screw bolt, a screw nut, and a cavity formed on the outside of the screw nut, 5749266 to Tsukada teaches in figures 25 and 26 the use of a guiding tube including a lubricating agent placed in a cavity inside of a screw nut, 4836042 to Slocum teaches the use of an entrance pipe 20 and an exit pipe 21 formed in a screw nut, and 3667311 to Wysong teaches the use of a portion of a ball recirculating guiding tube being placed outside of a screw nut.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melody M. Burch whose telephone number is 703-306-4618. The examiner can normally be reached on Monday-Friday (7:30 AM-4:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Lavinder can be reached on 703-308-3421. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-7687 for regular communications and 703-305-7687 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1113.

mmb 2/10/03
mmb
February 10, 2003

M. C. G. 2/10/2003

MATTHEW C. GRAHAM
PRIMARY EXAMINER
GROUP 310